

COMPLETE LISTING OF THE CLAIMS

Claim 1 (previously presented): An optical disk recording apparatus for forming pits on a recording surface of an optical disk of a given type at a given recording speed by applying a laser light in the form of a sequence of multiple pulses obtained by intermittently turning on and off the laser light according to a given multi-pulse pattern, the apparatus comprising:

a write strategy circuit that is set with a pattern table and controls the turning on and off of the laser light according to a multi-pulse pattern selected from the pattern table in correspondence to a length of the pit to be formed;

a storage section that stores a plurality of pattern tables of different kinds, each pattern table containing a plurality of multi-pulse patterns corresponding to a plurality of lengths of the pit, each of said plurality of multi-pulse patterns representing a sequence of multiple pulses of laser light for forming a single pit by intermittently turning on and off the laser light; and

a control section that selects one of the pattern tables based on either one or both of the recording speed and the type of the optical disk, and that reads out the selected pattern table from the storage section and sets the read pattern table in the write strategy circuit.

Claim 2 (original): The optical disk recording apparatus according to claim 1, wherein the storage section stores the plurality of the pattern tables in correspondence to a plurality of basic cycles of turning on and off the laser light, such that each pattern table contains the plurality of the multi-pulse patterns, all of which are arranged according to the basic cycle allotted to each pattern table and in matching with the plurality of the lengths of the pit.

Claim 3 (original): The optical disk recording apparatus according to claim 2, wherein the storage section stores a 1T pattern table corresponding to a pattern table of the basic cycle of 1T, so that the 1T pattern table enables the write strategy circuit to control the turning on and off of the laser light according to the multi-pulse patterns of the basic cycle of 1T, and stores a 2T pattern table corresponding to a pattern table of the basic cycle of 2T, so that the 2T pattern table enables the write strategy circuit to control the turning on and off of the laser light according to the multi-pulse patterns of the basic cycle of 2T.

Claim 4 (original): The optical disk recording apparatus according to claim 1, wherein the control section periodically monitors a change in the recording speed during recording, and selects the pattern table in response to the monitored change of the recording speed to thereby dynamically set the selected pattern table in the write strategy circuit.

Claim 5 (original): The optical disk recording apparatus according to claim 4, wherein the control section performs a first test recording with using the 1T pattern table to evaluate a quality of recording and a second test recording with using the 2T pattern table to evaluate a quality of recording separately from the first test recording before performing an actual recording, and selects one of the 1T pattern table and the 2T pattern table based on the respective qualities evaluated by the first test recording and the second test recording.

Claim 6 (original): The optical disk recording apparatus according to claim 1, wherein the storage section stores the multi-pulse patterns that have cycles of turning on and off the laser light ranging from 0.5T cycle through 3T cycle.

Claim 7 (original): The optical disk recording apparatus according to claim 6, wherein the control section performs different sessions of test recording separately from each other with using the respective multi-pulse patterns having the cycles ranging from 0.5T through 3T to evaluate respective qualities of the different sessions of the test recording before an actual recording, and selects one of the multi-pulse patterns having the cycles ranging from 0.5T through 3T based on the respective qualities evaluated by the different sessions of the test recording.

Claim 8 (previously presented): An optical disk recording apparatus for forming pits on a recording surface of an optical disk of a given type at a given recording speed by applying a laser light in the form of a sequence of multiple pulses obtained by intermittently turning on and off the laser light according to a given multi-pulse pattern while rotating the optical disk at a constant angular velocity such that a linear velocity of the optical disk varies, the apparatus comprising:

a write strategy circuit that is set with a pattern table and controls the turning on and off of the laser light according to a multi-pulse pattern selected from the pattern table in correspondence to a length of the pit to be formed;

a storage section that stores a plurality of pattern tables of different kinds, each pattern table containing a plurality of multi-pulse patterns corresponding to a plurality of lengths of the pit, each of said plurality of multi-pulse patterns representing a sequence of multiple pulses of laser light for forming a single pit by intermittently turning on and off the laser light; and

a control section that selects one of the pattern tables based on either one or both of the recording speed and the type of the optical disk and based on the varying linear velocity of the optical disk, and that reads out the selected pattern table from the storage section and sets the read pattern table in the write strategy circuit.

Claim 9 (original): The optical disk recording apparatus according to claim 8, wherein the storage section stores the plurality of the pattern tables in correspondence to pattern tables of a plurality of basic cycles of turning on and off the laser light, such that each pattern table contains the plurality of the multi-pulse patterns, all of which are arranged according to the basic cycle allotted to each pattern table and in matching with the plurality of the lengths of the pit.

Claim 10 (original): The optical disk recording apparatus according to claim 9, wherein the storage section stores a 1T pattern table corresponding to a pattern table of the basic cycle of 1T, so that the 1T pattern table enables the write strategy circuit to control the turning on and off of the laser light according to the basic cycle of 1T, and stores a 2T pattern table corresponding to a pattern table of the basic cycle of 2T, so that the 2T pattern table enables the write strategy circuit to control the turning on and off of the laser light according to the basic cycle of 2T.

Claim 11 (original): The optical disk recording apparatus according to claim 8, wherein the control section periodically monitors a change in the recording speed during recording, and selects the pattern table in response to the monitored change of the recording speed to thereby dynamically set the selected pattern table in the write strategy circuit.

Claim 12 (original): The optical disk recording apparatus according to claim 11, wherein the control section performs a first test recording with using the 1T pattern table to evaluate a quality of recording and a second test recording with using the 2T pattern table to evaluate a quality of recording separately from the first test recording before performing an actual recording, and selects one of the 1T pattern table and the 2T pattern table based on the respective qualities evaluated by the first test recording and the second test recording.

Claim 13 (original): The optical disk recording apparatus according to claim 8, wherein the storage section stores the multi-pulse patterns that have cycles of turning on and off the laser light ranging from 0.5T cycle through 3T cycle.

Claim 14 (original): The optical disk recording apparatus according to claim 13, wherein the control section performs different sessions of test recording separately from each other with using the respective multi-pulse patterns having the cycles ranging from $0.5T$ through $3T$ to evaluate respective qualities of the different sessions of the test recording before an actual recording, and selects one of the multi-pulse patterns having the cycles ranging from $0.5T$ through $3T$ based on the respective qualities evaluated by the different sessions of the test recording.

Claim 15 (previously presented): A method of forming pits on a recording surface of an optical disk of a given type at a given recording speed by applying a laser light in the form of a sequence of multiple pulses obtained by intermittently turning on and off the laser light according to a given multi-pulse pattern, the method comprising:

a write strategy process settable with a pattern table and capable of controlling the turning on and off of the laser light according to a multi-pulse pattern selected from the pattern table in correspondence to a length of the pit to be formed;

a storage process of storing a plurality of pattern tables of different kinds in a storage, each pattern table containing a plurality of multi-pulse patterns corresponding to a plurality of lengths of the pit, each of said plurality of multi-pulse patterns representing a sequence of multiple pulses of laser light for forming a single pit by intermittently turning on and off the laser light; and

a control process of selecting one of the pattern tables based on either one or both of the recording speed and the type of the optical disk, and retrieving the selected pattern table from the storage and setting the read pattern table in the write strategy process.

Claim 16 (previously presented): A method of forming pits on a recording surface of an optical disk of a given type at a given recording speed by applying a laser light in the form of a sequence of multiple pulses obtained by intermittently turning on and off the laser light according to a given multi-pulse pattern while rotating the optical disk at a constant angular velocity such that a linear velocity of the optical disk varies relative to a spot of the laser light, the method comprising:

a write strategy process settable with a pattern table and capable of controlling the turning on and off of the laser light according to said linear velocity and a multi-pulse pattern selected from the pattern table in correspondence to a length of the pit to be formed;

a storage process of storing a plurality of pattern tables of different kinds in a storage, each pattern table containing a plurality of multi-pulse patterns corresponding to a plurality of lengths of the pit, each of said plurality of multi-pulse patterns representing a sequence of multiple pulses of laser light effected by intermittently turning on and off the laser light; and

a control process of selecting one of the pattern tables based on either one or both of the recording speed and the type of the optical disk and based on the varying linear velocity of the optical disk, and retrieving the selected pattern table from the storage and setting the read pattern table in the write strategy process.

Claim 17 (previously presented): A computer-readable medium encoded with a computer program for use in an optical disk recording apparatus designed for forming pits on a recording surface of an optical disk of a given type at a given recording speed by applying a laser light in the form of a sequence of multiple pulses obtained by intermittently turning on and off the laser light according to a given multi-pulse pattern, the program being executable by the optical disk recording apparatus for performing a method comprising:

a write strategy process settable with a pattern table and capable of controlling the turning on and off of the laser light according to a multi-pulse pattern selected from the pattern table in correspondence to a length of the pit to be formed;

a storage process of storing a plurality of pattern tables of different kinds in a storage, each pattern table containing a plurality of multi-pulse patterns corresponding to a plurality of lengths of the pit, each of said plurality of multi-pulse patterns representing a sequence of multiple pulses of laser light for forming a single pit by intermittently turning on and off the laser light; and

a control process of selecting one of the pattern tables based on either one or both of the recording speed and the type of the optical disk, and retrieving the selected pattern table from the storage and setting the read pattern table in the write strategy process.

Claim 18 (previously presented): A computer-readable medium encoded with a computer program for use in an optical disk recording apparatus designed for forming pits on a recording surface of an optical disk of a given type at a given recording speed by applying a laser light in the form of a sequence of multiple pulses obtained by intermittently turning on and off the laser light according to a given multi-pulse pattern while rotating the optical disk at a constant angular velocity such that a linear velocity of the optical disk varies relative to a spot of the laser light, the program being executable by the optical disk recording apparatus for performing a method comprising:

a write strategy process settable with a pattern table and capable of controlling the turning on and off of the laser light according to a multi-pulse pattern selected from the pattern table in correspondence to a length of the pit to be formed;

a storage process of storing a plurality of pattern tables of different kinds in a storage, each pattern table containing a plurality of multi-pulse patterns corresponding to a plurality of lengths of the pit, each of said plurality of multi-pulse patterns representing a sequence of multiple pulses of laser light for forming a single pit by intermittently turning on and off the laser light; and

a control process of selecting one of the pattern tables based on either one or both of the recording speed and the type of the optical disk and based on the varying linear velocity of the optical disk, and retrieving the selected pattern table from the storage and setting the read pattern table in the write strategy process.

Claim 19 (previously presented): A system for forming pits on a recording surface of an optical disk of a given type at a given recording speed by applying a laser light in the form of a sequence of multiple pulses obtained by intermittently turning on and off the laser light according to a given multi-pulse pattern, the system comprising:

an optical disk; and

a disk recording apparatus, said apparatus comprising:

a write strategy circuit that is set with a pattern table and controls the turning on and off of the laser light according to a multi-pulse pattern selected from the pattern table in correspondence to a length of the pit to be formed,

a storage section that stores a plurality of pattern tables of different kinds, each pattern table containing a plurality of multi-pulse patterns corresponding to a plurality of lengths of the pit, each of said plurality of multi-pulse patterns representing a sequence of multiple pulses of laser light for forming a single pit by intermittently turning on and off the laser light, and

a control section that selects one of the pattern tables based on either one or both of the recording speed and the type of the optical disk, and that reads out the selected pattern table from the storage section and sets the read pattern table in the write strategy circuit.

Claim 20 (previously presented): A system for forming pits on a recording surface of an optical disk of a given type at a given recording speed by applying a laser light in the form of a sequence of multiple pulses obtained by intermittently turning on and off the laser light according to a given multi-pulse pattern while rotating the optical disk at a constant angular velocity such that a linear velocity of the optical disk varies, the apparatus comprising, the system comprising:

an optical disk; and

an disk recording apparatus, said apparatus comprising:

a write strategy circuit that is set with a pattern table and controls the turning on and off of the laser light according to a multi-pulse pattern selected from the pattern table in correspondence to a length of the pit to be formed;

a storage section that stores a plurality of pattern tables of different kinds, each pattern table containing a plurality of multi-pulse patterns corresponding to a plurality of lengths of the pit, each of said plurality of multi-pulse patterns representing a sequence of multiple pulses of laser light for forming a single pit by intermittently turning on and off the laser light; and

a control section that selects one of the pattern tables based on either one or both of the recording speed and the type of the optical disk and based on the varying linear velocity of the optical disk, and that reads out the selected pattern table from the storage section and sets the read pattern table in the write strategy circuit.